Annual Report

FOREST PEST CONDITIONS IN WISCONSIN

1960

WISCONSIN CONSERVATION DEPARTMENT

FOREST MANAGEMENT DIVISION

FOREST PESTS — SURVEY AND CONTROL

A N N U A L R E P O R T

FOREST PEST CONDITIONS

IN

WISCONSIN

1960

FOREWORD

This report is the result of the cooperative efforts of the area entomologists, and the assistance given the pest control section by numerous Department personnel, and others, who are acting as forest pest observers throughout the state. The observers are doing an increasingly effective job of reporting pest conditions they encounter in the performance of their regular field work. Their help is greatly appreciated.

Timely reporting of pest conditions will permit prompt action to be taken when necessary thereby minimizing losses.

INTRODUCTION

Several forest pests were sufficiently active in 1960, to attract attention of the general public because of their nuisance value and because they were threatening favored tree species or extensive forested areas.

The jack pine budworm continued to increase in number in parts of the Northwest Area. Defoliation was severe enough in stands in Burnett, Washburn, Douglas, and Bayfield Counties that chemical control will have to be considered for some of them in 1961.

The introduced pine sawfly was found further east and over a much wider area in the state than it had been previously reported. Defoliation of white pine in northwest Wisconsin was cause for concern by many individuals as indicated by the number of reports received by the pest control section.

Parts of Marinette County were plagued by walking sticks which were a nuisance around resorts and private homes as well as in the forested areas where stands of red and scrub oak were primarily affected.

Defoliation of aspen, caused by the large aspen tortrix, was reported from parts of the Northwest and West Central Areas.

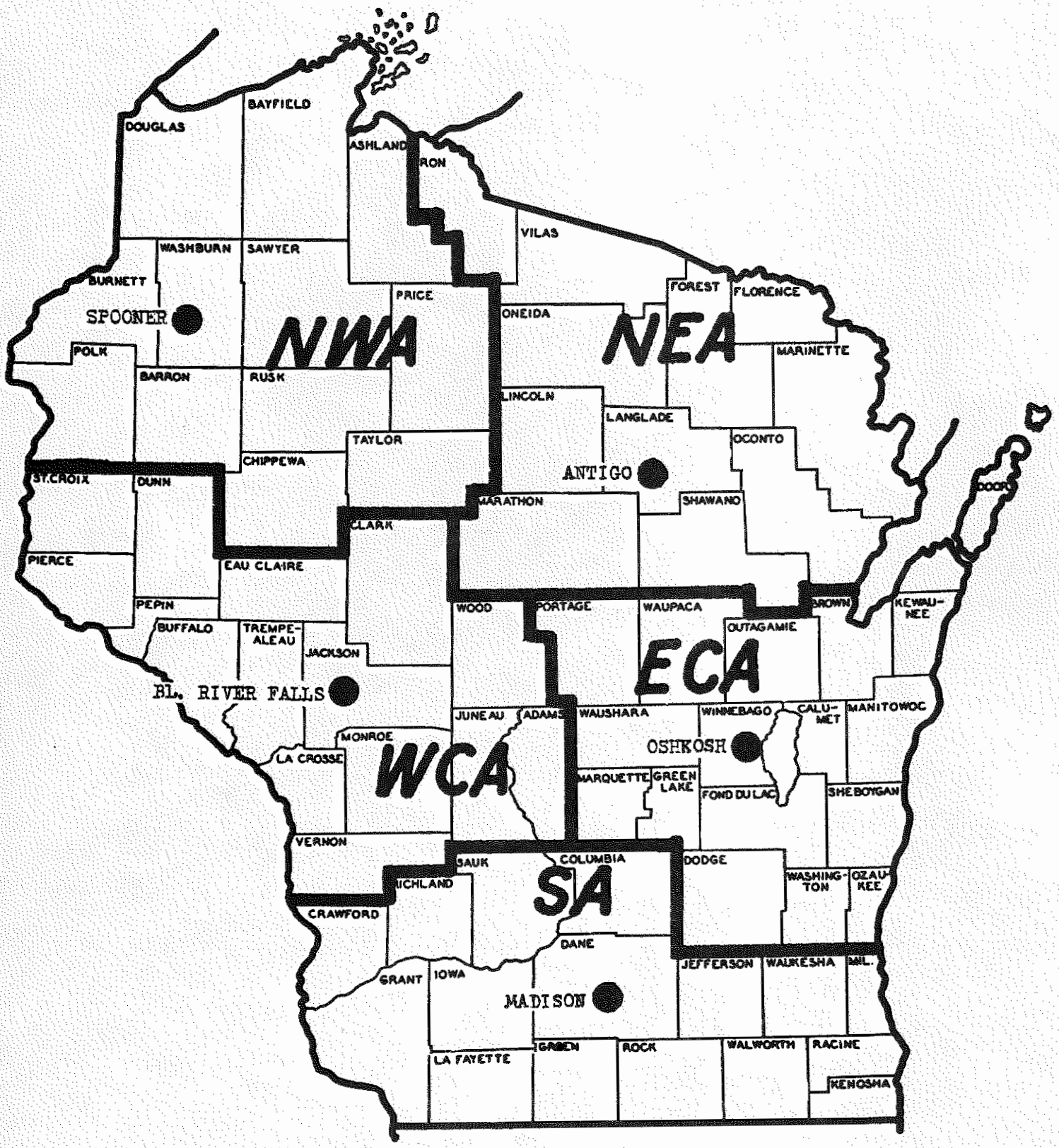
Localized problems with bark beetles in pines occurred in several parts of the state. An apparent complex of root-feeding weevils and root rots may be responsible for decadence in some pine stands.

Forest tent caterpillar populations were at their lowest levels in recent years. Defoliators of maple in northern Wisconsin, including the leafrollers, webworms, and saddled-prominent, remained endemic.

The Saratoga spittlebug required chemical control on 1,644 acres in six counties.

Conditions in the known maple blight areas remained much the same as they were in 1959. There was no spread of the blight. White pine blister rust continued to be a problem in many parts of the state. Oak wilt caused appreciable tree mortality in southern oak stands.

OFFICES OF THE AREA ENTOMOLOGISTS



MAJOR FOREST INSECTS REPORTED

The insects and diseases discussed on the following pages are not necessarily arranged in order of their importance as forest pests. However, the six major orders represented are alphabetically arranged. Biological data from field notes has been included after the discussion of each species. As this information accumulates over the years it will become increasingly useful in conducting survey and control work.

A map of the state outlining each of the five areas has been included as frequent reference to the areas is made in the text.

COLEOPTERA

White Pine Weevil -- Pissodes strobi (Peck)

Attacks were more numerous than last year throughout the Northwest Area on both white and jack pines. Many plantations had dead leaders on over 10 per cent of the trees.

In the northeast attacks on plantations appeared to be less severe than they were in 1959. White and jack pine plantings had 10 to 20 per cent of the leaders attacked in many instances. This was a decrease of approximately 10 per cent as compared to the previous year. About 10 to 15 per cent of the leaders were infested in some red pine plantings in Oneida and Marinette Counties, however, this was not general in red pine plantings in the Northeast Area.

There was a slight increase in weevil activity in the East Central Area generally. White pine sustained most of the damage; little was incurred by jack pine and damage to red pine was nil. The degree of infestation ranged upwards to 30 per cent with the majority of the more severely infested plantations having about 20 per cent of the leaders infested.

Populations in the West Central Area were somewhat lower than in 1959. Attacks ranged from 10 to 30 per cent in white pine plantations and in open stands. Red pine was rarely attacked and jack pine damage seldom reached 10 per cent.

In Dellona and Delton Townships (Sauk County) infestation levels were high in stands ranging in size from saplings to small sawtimber.

Control Efforts

Assistance was given with two small white pine weevil control projects in April in the West Central Area. About 1,000 white pines were treated in the Tuttle School Forest near Tomah (Monroe County), in preparation for a Vocational Agriculture class demonstration and field lecture. About 2,000 white pines and a few Norway spruce were sprayed in a plantation in the Perry Creek Park area of the Black River State Forest. Concentrated lead arsenate spray was applied to terminal shoots with knapsack sprayers in both plantations. Early evaluation of the projects indicate definite reductions in weevil damage in comparison with previous years and other nearby areas in 1960.

About 500 white pines were treated in a Monroe County plantation by a private landowner.

Mechanical control (clipping and burning of infested tips) was carried out at the Wild Rose Hatchery plantings. The degree of infestation was about one per cent. Because of the excellent growth of the trees and the comparative isolation of the blocks, control was initiated in an effort to keep the damage low and allow for more selective thinning in the future thus insuring a higher quality residual stand. The work was done by the hatchery crew.

Assistance was given with planning and the control of weevil in small blocks (2 to 5 acres) of white pine, Scotch pine, and Norway spruce. Results obtained with lindane and aroclor in these tests looks promising.

Note: Northwest Area -- Heavy feeding observed in Burnett County on April 22; pairing noted on the same date. Adult weevils were numerous in areas checked. First leader mortality was noted on June 18, Mid- and late instars, and pupation were observed in Burnett and Washburn Counties on June 25.

Northeast Area -- Adult weevils were very active in Oconto, Langlade and Lincoln Counties, and pairing observed in Langlade County between May 15 and 25.

West Central Area -- Mating and oviposition occurring in Jackson County on white and jack pine, May 15-21. Mid- and late stage larvae present in Juneau County by June 11, and in Wood County, June 26.

East Central Area -- Oviposition was occurring on white pine and Norway spruce in Marquette, Waushara, and Waupaca Counties during the period between May 22 and 28.

Southern Area -- Egg laying was observed in Sauk County on May 18, and some early instar larvae were found on the same date. Larvae were in mid- and late instars in Sauk County by June 11. Mature larvae were present by June 21. Newly emerged and mature adults appeared by August 5, although some prepupae and pupae were also observed. Unsuccessful broods were common, apparently as a result of disease and dipterous predators. Major adult emergence was observed between August 21, and 27, although pupae were still present in low numbers in white pine terminals.

Pine Root Collar Weevil -- Hylobius radicis Buchanan.

Plantations in Polk, Chippewa, Washburn, parts of Douglas and Bayfield Counties continue under heavy attack by this insect. Larvae were very numerous during the late summer and many plantations were near 100 per cent infested. Mortality continued to show in infested stands and wind throw was common.

The only serious attacks reported in the northeast counties were in Scotch pine Christmas tree plantings in Shawano and Langlade Counties. Some red pine windbreaks were damaged in Marinette and Oconto Counties.

Scotch pine Christmas tree plantings were damaged in Jackson County and many trees have been killed in older jack and red pine plantations in Eau Claire County. Shelterbelts in Buffalo, Dunn, and Eau Claire Counties lost many trees in 1960, because of weevil attack.

The weevil is present over most of the East Central Area also, although attacks are not usually noticed until trees brown or have been tilted. Spot checks of the area indicate the weevil or related species are more prevalent than previously supposed.

Severe damage by root collar weevils was observed in a thinned and pruned red pine plantation in southern Sauk County, while in the north-central part of the county a serious infestation has resulted in excessive mortality of Scotch pine.

Note: Larval stages were dug up in the vicinity of the root collars of red pine in Oconto and Waushara Counties on May 23. Larvae were predominantly in the mid-stages of development in Burnett County, and late larval stages were most numerous in Juneau County on Scotch and jack pine on June 26.

Root-Tip-Feeding Weevil -- Unidentified

An unidentified weevil, closely related to the root collar weevil, has caused serious damage and mortality in jack pine plantations by destroying feeder roots. In the Black River State Forest, 196 acres are known to be infested. Thirty-eight acres of the most severely damaged twenty-year-old plantation were set up for salvage cutting and 68.7 cords of pulpwood were harvested in 1960. Many acres of NEPCO (Nekoosa-Edwards Paper Co.) lands and county plantations in Wood and Adams Counties appear to be infested. Infestations have also been found in Monroe, Clark, and Eau Claire County plantations. These infestations are mostly in old-field plantations of jack pine but associated red pine is also affected.

Root weevil damage and root rot have been found in combination in numerous parts of Polk, Burnett, Washburn, and Douglas Counties. Both natural and plantation trees are affected. Mortality of seedlings and pole-size trees is occurring in jack pine and red pine stands.

Pine Bark Beetles -- Ips sp.

The high populations of 1959, appear to have collapsed in the Northwest Area. No new attacks were found in localities where tree mortality occurred last year. Predators and adverse weather conditions apparently contributed in reducing populations to endemic numbers in most locations.

However, in the West Central Area bark beetles remained a problem in some localities. Late summer broods attacked and killed occasional trees and groups of trees in jack pine stands in Clark, Eau Claire, Jackson, and Wood Counties.

Bark beetles killed trees in the vicinity of pulpwood piles left in the woods through July in at least one pulpwood operation in Jackson County. Beetles killed more than 30 per cent of the residual stand on a few acres after emerging from jack pine pulp sticks left scattered through a red pine plantation in Eau Claire County in which a summer Timber Stand Improvement operation removed over-topping jack pine and oak.

Bark beetles appeared to be a major cause of tree mortality in a twenty-year-old Wood County plantation in which trees have been dying in pockets over the last three to five years. Apparently overcrowding of the site reduced vigor of the stand enough to make the trees susceptible to bark beetle attack.

Group tree mortality was reported in a Sauk County red pine plantation where silvicultural control operations were recommended in 1959. Otherwise tree mortality was negligible in the southern counties.

Note: Ips sp. starting nuptial chambers in Douglas County on May 20. Dendroctonus valens Le Conte laying eggs in red pine in Oconto County on May 25. Clerids active on same tree. Mating pairs, eggs, larvae observed in Douglas County red pine, June 10 (Ips and Dendroctonus). Eggs, larvae, and ovipositing adults were present July 11 to 16, on red pine in Columbia County. Pupae and newly emerged adults were found between August 14 and 20, at the same location on the same host. Mating pairs of Ips and Dendroctonus sp. eggs, and early instar larvae were observed on June 10, in Douglas County on red pine.

Bark Beetles -- Pityophthorus sp.

These small insects have become increasingly importatnt in many red pine plantations in the Northwest Area. Their galleries cause twig mortality and sometimes leader mortality, leading to top killing and deformity of the trees.

Note: Adults were observed ovipositing in elongating red pine lateral and terminal shoots in southern counties on May 25.

Bark Beetles -- Scolytus quadrispinosus Say

This beetle has been associated with heavy mortality in hickory-oak stands in southeastern Dane County. Silvicultural and sanitation cutting in one stand, started in 1959, was continued in 1960, in an attempt to reduce the beetle populations.

White Grubs -- Phyllophaga sp.

No serious white grub problems were reported from any areas. The use of soil insecticides is a common pratice in most parts of the state where grubs are likely to be a problem, but acreage treated varies from year to year. The spray is applied directly to the roots of planting stock and into the furrow directly into the soil to be occupied by the roots of the seedlings. The treated spots are covered by the packing wheels as the furrow is closed so the soil is not exposed to other animal life on the surface and the insecticide is not likely to be washed away by surface run-off water to contaminate streams or lakes.

In the Northeast Area practically all new plantings are being treated either by spraying or dipping roots of planting stock. A soil insecticide for protection against grub damage was used for the first time in Jackson County in 1960, when approximately 70 per cent of the trees planted on county forest land were treated. Soil insecticides were also used in Adams, Wood, and Juneau Counties in some plantings.

In the East Central Area, a nominal amount of grub damage occurred. The acreage treated was approximately one-half that of the previous year. Acreage treated in this area is listed on the following page by counties.

County	Number of Acres Treated
Brown	33.5
Door	19
Fond du Lac	45
Green Lake	10
Kewaunee	23
Manitowoc	102
Marquette	100
Outagamie	60
Ozaukee	53
Portage	140
Sheboygan	28
Washington	130.5
Waupaca	81
Waushara	200
Winnebago	10
Total	1,035 Acres

Note: Phyllophaga drakii (Kby.) adults numerous in Langlade County the first week in June.

Weevil -- Sciaphilus asperatus Donsd.

This weevil was collected in large numbers from beech, sugar maple, ash, ironwood, and various ground shrubs, including gooseberry, in Peninsula State Park (Door County) on September 22. Although feeding-damage was noticeable in the tree crowns and on the shrubs it was not sufficient to harm the trees. The same weevil was collected from grape vines in Antigo (Langlade County) a few days later.

Specimens sent to the U. S. National Museum were identified by R. E. Warner. According to him no specimens from Wisconsin were represented in the U.S.N.M. collection, and locations nearest Wisconsin from which specimens had been received were in Ontario, Canada, and Oakland County, Michigan. No males are represented in the U.S.N.M. collection.

DIPTERA

Red Pine Needle Midge

The midge was a problem mostly in the West Central and Southern Areas in 1960, although it was reported from all the areas. In the West Central Area damage was somewhat less than in 1959. Red pine plantings in Adams, Clark, Eau Claire, Jackson, Juneau and Wood Counties were most severely affected. The east-central part of Sauk County also had heavy infestations. In general attacks were lighter in the Northwest Area than in 1959.

Repeated attack has reduced height growth and caused occasional terminal dieback in the West Central Area. Attacks have been observed on trees two feet high and taller. The needle loss which occurs can be serious enough to make trees worthless for marketing as Christmas trees.

University entomologists are conducting research on the problem.

HEMPITERA

Saratoga Spittlebug -- Aphrophora saratogensis (Fitch)

Approximately 20,000 acres of susceptible red pine plantations were surveyed for spittlebug nymphs in the northern counties to determine the need for chemical control. Lands surveyed included state, county, township, industrial, and private ownerships.

Infested plantations requiring control totaled nearly 1,600 acres over a five-county area in the northeast. Although nymphal counts were generally higher than in 1959, in the northwest, only 45 acres required treatment in Douglas County.

Aircraft were used to apply DDT at the rate of one pound per gallon per acre at a cost of $1.98 per acre for the material and its application on 1,599 acres. Spraying commenced on July 26, and was completed on July 30.

Two portable mist blowers were used to treat an isolated 45-acre block in Douglas County. One of them was a back-pack unit loaned by the National Agricultural Supply Co. of Fort Atkinson. This machine proved to be a very practical and convenient unit for use in remote areas accessible only on foot, and which for various reasons could not be sprayed economically with aircraft.

Excellent results were obtained with both the aircraft and the mist blowers.

The acreage treated and the cost of aerial application were as follows:

Owner	Acreage Sprayed	Cost to Owner	Cost to State	Total Cost
Florence Co. (Co. Forest Crop)	260	$ 99.00	$415.80	$ 514.80
Marinette Co. (Co. Forest Crop)	849	682.11	998.91	1,681.02
Oconto Co. (Co. Forest Crop)	70		138.60	138.60
Oneida Co. (Co. Forest Crop)	90		178.20	178.20
Vilas Co. (Co. Forest Crop)	87		172.26	172.26
(N. H. State For.)	243		481.14	481.14
	1,599 A	$781. 11	$2,384.91	$ 3,166.02

Note: First nymphs were observed on wild strawberry and sweet fern in Langlade County on May 23. Many eggs in the same vicinity had not yet hatched on that date.

Second stage nymphs were found in Vilas, Marinette, and Oconto Counties the first week in June. Mid-instars were present in Wood and Douglas Counties the first week in July.

First adults in the northwest counties were noted on July 16, and adult emergence was complete by the end of July. Pairing and oviposition were observed in Douglas County on August 23.

Pine Spittlebug -- Aphrophora parallela (Say)

Locally heavy infestations were reported in Oconto, Langlade, and Oneida Counties. Scotch pine was the most heavily infested host species. Light to moderate infestations were common throughout the rest of the state. No appreciable damage to infested trees was reported, although some trees had been attacked repeatedly.

Note: Numphs were in the second instar in Dane County on May 13, and in the northwest counties by May 16, and had reached a length of five mm. in Grant County by May 25. The last nymphal stage was reached in Columbia County by June 21, and one adult was collected on that date. Numerous empty nymphal casts and adult spittlebugs were observed on jack pine in Polk County on July 14.

Black Pine Leaf Scale -- Aspidiotus californicus Coleman

A rapid build-up of this insect in northern Polk County resulted in severe damage and some mortality to jack pine on an area covering six sections (T36N, R20W, Sections 4, 5, 8, 9, 16, and 17). The most serious losses occurred in plantations about 20 years old, although near-mature natural jack pine in the same sections was affected also.

Parasites and predators appear to have reduced the scale populations considerably as the season progressed. Most prominent among the predators was the twice-stabbed lady beetle, Chilocorus stigma (Say). Pupae of this beetle were found in large numbers on the bare twigs of the jack pine, particularly on the lower branches.

Note: Emergence of Chilocorus stigma (Say) adults was just starting on July 14, in Polk County. Newly emerged beetles were pale yellow with orange spots, changing to black with orange spots within 12 hours.

The scale was common but present in low numbers on jack and red pine in the Southern Area, and was recorded from Pinus virginia Mill. in Columbia County.

Pine Tortoise Scale -- Toumeyella numismaticum (P. & McD.)

One area of several sections in Douglas County had moderate to heavy populations in the spring of 1960. Subsequent checks of the area showed increasing activity by parasites and predators, and by fall the scale populations had been reduced to endemic numbers. Chemical control was not necessary.

Scattered light infestations were reported by observers in Vilas and Marinette Counties, but no serious build-up materialized.

Note: Crawlers started emerging and moving on to the new growth the week of June 19-25, in Polk and Douglas Counties. Coccinelid larvae were very numerous and active on infested twigs. An unidentified, minute, brightly colored wasp was observed ovipositing on the adult female scales in both counties at this time.

Eggs and crawlers were observed in Burnett County during the period between June 26 and July 2, and had reached mid-stages of development by July 17. Crawlers were observed in Marinette County on jack pine on July 11.

Pine Needle Scale -- Phenacaspis pinifoliae (Fitch)

Populations appear to be quite high in the Mississippi River Valley in the West Central Area. A heavy infestation was eliminated in a Perrot State Park (Trempealeau County) white pine planation by twice-stabbed lady beetles, Chilocorus stigma (Say), and other natural control factors. The scale was common throughout the Southern Area, usually in low numbers, although a heavy infestation was reported on mugho pine in Jefferson County.

Note: Twice-stabbed lady beetles were very numerous, pairing, and feeding on the egg-filled scales in Perrot Park on April 28. Eggs in Jefferson County had not hatched by May 24, although crawlers were observed on red pine in Iowa County on May 23.

Pine Bark Aphid -- Pineus strobi (Htg.)

Chemical treatment of seedling beds at the state nurseries kept populations at low levels compared to those of previous years. It was not necessary to dip nursery stock in insecticide solution as was done before shipping in 1959.

An infestation on white pine sawtimber and pole-size trees still persists in Wyalusing State Park (Grant County) after at least six years. The previously heavy infestation was so light on these trees in the spring that evaluation of a systemic insecticide treatment was not possible.

Note: Eggs and a few crawlers observed on white pine near Siren (Burnett County), on May 18.

Pentatomid -- Chlorochroa uhleri Stal.

Adults of this "stink-bug" were observed feeding on the main stems and larger branches of three to four-foot tall plantation red pine in the Arena School Forest, Iowa County, on May 13. It was reported again on September 26, and as late as October 6. The importance of this pest is not known.

HYMENOPTERA

Introduced Pine Sawfly -- Diprion similis (Htg.)

Severe defoliation by late generation larvae occurred in parts of Polk, Burnett, Dunn, Washburn, Bayfield, Sawyer, Marathon, and Lincoln Counties. Defoliation appeared to be most severe on windbreaks and open-growing individual trees, and was variable in the better stocked white pine stands. Other tree species affected were red pine, jack pine and Scotch pine. This pest was reported for the first time from Marathon and Lincoln Counties where some windbreaks suffered severe defoliation. It was found as far east as Langlade County and Canadian entomologists reported finding it near Shawano (Shawano County). It was reported for the first time from the northwest corner of Portage County on scattered white pine. (See map, page 10).

In the West Central Area, the fall generation was also much heavier than the first. Medium defoliation was found frequently in exposed stands but few trees were completely defoliated. Parasitized or diseased larvae were observed in Dunn County, and parasites and disease were prevalent in much of the Northwest Area in the fall. According to cocoon collections and parasitism studies of Lincoln and Marathon County material it appears that the outbreak may continue there next year unless mortality of over-wintering cocooned larvae is high.

Note: Eggs and near-mature larvae were collected on windbreak white pine near Siren (Burnett County) on June 22.

Red-Headed Pine Sawfly -- Neodiprion lecontei (Fitch)

Populations were generally low in the Northwest Area, although scattered colonies were found in Polk, Burnett, Washburn, Sawyer, and Douglas Counties. Heavy infestations in young red pine plantings were reported in Oneida, Langlade, and Vilas Counties, and it was necessary to spray 25 acres in Marinette County with DDT. Generally this sawfly was quite numerous and troublesome in scattered locations in the East Central counties, but populations in this part of the state were low for the third consecutive season. No serious problems were reported in west central or southern counties.

Note: Early instar larvae first reported on July 13, on jack pine in Columbia County where mid- and late instars were attained by July 28, and cocoons were found by August 5. Cocooning was near complete in Columbia County by August 16.

Red Pine Sawfly -- Neodiprion nanulus nanulus Schedl.

Scattered colonies were found on red and jack pine in Polk, Burnett, and Douglas Counties. Populations remained unchanged in the northwest as compared to 1959. The sawfly was present in many red and jack pine stands in the West Central Area, but numbers were low, and there was a very definite drop from 1959 levels. One heavy infestation was reported in a 30-acre red pine planting in Oconto County, but other northeast counties had no problem with this sawfly.

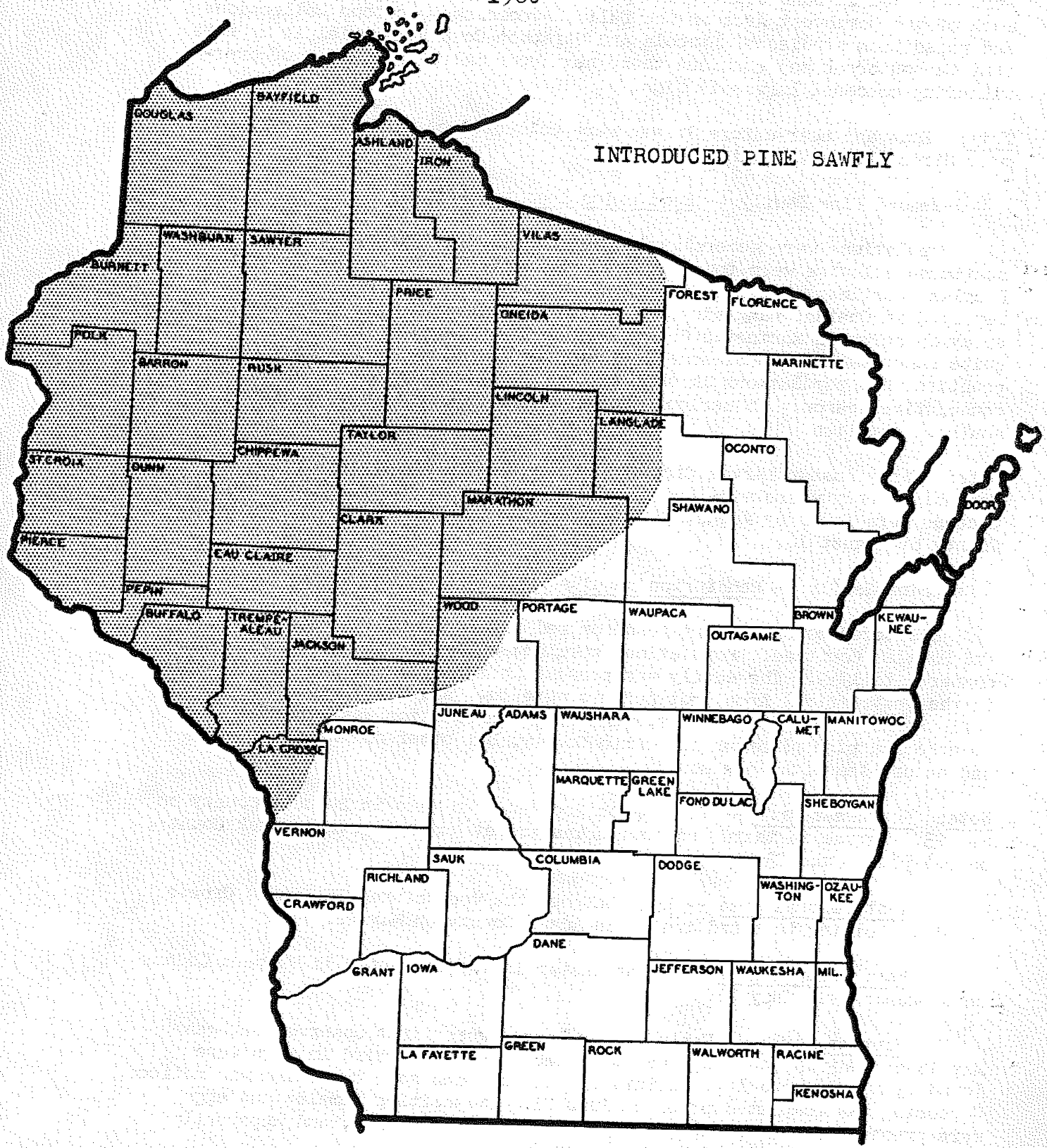
Note: Northwest Area -- Feeding on jack and red pine in Burnett County on May 23. Larvae in third and fourth instars at Murphy Flowage, Rusk County, on red pine, June 23.

West Central Area -- Eggs hatched the week of May 15, in La Crosse County. Molting to third instar in Adams County on May 26.

East Central Area -- First instar larvae collected in Waupaca County near Scandinavia, May 21.

Southern Area -- Early instar larvae were first observed between May 15 and May 25, on red pine in Columbia County. Third instars were found by May 31, and late instars by June 8, when some cocooning was noticed. Cocooning was completed prior to June 21. Ovipositing females and eggs were present in the Columbia County stand on September 9, and apparently oviposition was completed by September 28.

FOREST INSECT CONDITIONS IN WISCONSIN 1960



GENERAL AREA WHERE INSECT HAS BEEN LOCATED

Larch Sawfly -- Pristophora erichsonii (Htg.)

Defoliation appeared to be more variable in northern larch stands than it was last year, ranging from none to complete. Permanent plots in the northwest and west central counties were re-examined for growth loss and mortality. In plots in west central stands remeasurement of marked trees indicated growth has been severly retarded the past two seasons. The only mortality in the plots occurred in one severely damaged by hail in 1959, but top killing was evident in many west central stands.

In some northeast and east central stands a decline in larval populations was observed. This was attributed largely to unusually high water levels in these stands.

Three hundred larvae were collected from three different localities in the northeast in late June, and 46 per cent of these contained parasite eggs.

Note: Eggs and early instar larvae were observed on European larch in Columbia and Grant Counties on May 25. Oviposition was observed in Langlade County on June 1. All eggs were apparently hatched in Sauk County stands by June 21, when larvae averaged 1/4 inches in length. The egg stage was predominant in Waushara County on June 19. Eggs to third instar larvae were found in Burnett and Douglas Counties on June 22, and the new growth on larch was two to four inches long. On the same date most of the larvae were in the second and third instars in Washburn County and new growth was three to four inches long. Cocooning had started in Dane County by July 12, and was completed by July 22. Larval development was completed in the northeast counties between August 14 and August 20.

Swaine Jack Pine Sawfly -- Neodiprion swainei Middleton

This sawfly was reported from a number of locations throughout the state but no serious damage was encountered anywhere. Canadian entomologists, studying sawflies in Wisconsin last summer, provided considerable information on the distribution of the pest in the state. They reported it from the following locations: near Odanah (Ashland County), near Gordon (Douglas County), near Amberg (Marinette County), in the vicinities of Knowlton and Rothschild (Marathon County), in the vicinities of Eagle River and Land O' Lakes (Vilas County), near Couderay (Sawyer County), and in the vicinities of Spooner and Lampson (Washburn County).

Note: Ovipositing adults were observed between June 8 and June 21, in Columbia County, and one was found as late as June 21. Eggs were swelling in Columbia County on June 29, and hatching commenced about July 1. Eggs and early instar larvae were found in Dane and Columbia Counties between July 7 and July 11, on jack pine and lodgepole pine. First instar larvae were observed at Pine Bluff (Dane County) on July 7. Early to mid-instar were observed on jack pine, lodgepole pine, and Virginia pine from July 13 to July 24, and mid- to late instar larvae and cocoons from July 27 to September 1, in Columbia County. Cocooning was near completion about September 28, in Columbia County and complete by October 6, in Dane County.

Neodiprion virginianus complex

Defoliation by this sawfly was negligible according to reports received. Canadian entomologists reported observing it near Amberg (Marinette County), Land O' Lakes (Vilas County), Eagle River (Vilas County), and at St. Germain (Vilas County).

Note: A single colony of late instar larvae were observed feeding on jack pine in Columbia County on July 13. By August 5, only a single larva could be found in the same plantation. Late instar larvae were collected from jack pine in Dane County on July 21. The amount of defoliation in the vicinity of these larvae seemed to indicate that some of the colony had already cocooned.

White Pine Sawfly -- Neodiprion pinetum (Norton)

This insect was primarily a pest of white pine in the southern counties. In general, defoliation was not as severe or as extensive as in 1959. Defoliation was light to medium in Kenosha County, and severe defoliation occurred on trees near Mineral Point (Iowa County).

Note: Larvae were first noted between July 1 and July 5, in Kenosha County where cocooning was near complete by July 30. Late instar larvae and cocoons were observed on August 17, at the Whitewater Recreation Area (Walworth County). Cocooning was completed between August 14 and August 20, in Waukesha and Columbia Counties. Late instar larvae were reported on September 22, in Sauk County. Late instar larvae were still on the trees near Mineral Point (Iowa County), on October 20.

Jack Pine Sawfly -- Neodiprion pratti banksianae (Roh.)

A few isolated colonies were reported in Polk, Burnett, Douglas and Bayfield Counties. Defoliation was light.

Note: Early larval stages were found in Douglas County on June 28.

Sawfly on Dogwood -- Macremphytus sp.

All the dogwood in an 80-acre hardwood stand in Iowa County was completely defoliated by this sawfly by August 18. Mid- to late instar larvae were collected in Columbia County on August 27.

LEPIDOPTERA

Jack Pine Budworm -- Choristoneura pinus (Freeman)

Early larval stages were counted at 100 collection points in the five-county jack pine area in the northwest in late May and early June. High populations were found on approximately 20,000 acres in parts of Burnett, Washburn, Douglas, and Bayfield Counties, as had been predicted from egg mass surveys made in 1959. Light to moderate populations were found in the remaining area.

During mid-June fourth and fifth instar larval counts were made at 50 collection points in the area of heavy infestation. Counts were moderately high in some localities, but parasites were numerous and it was decided to forego chemical control in order to give the parasites and predators a chance to exert their maximum influence on the budworm population. Late in June fifth and sixth instar larval counts were made throughout the jack pine type. Although parasitism was high at that time, populations of budworm were also high in some localities.

The jack pine type was surveyed from the air on July 13, and areas of defoliation were mapped. Areas of severe browning coincided with those on which early larval counts had been high. Some stands sustained severe to almost complete defoliation.

Egg-mass surveys were conducted in August, at 90 collection points throughout the jack pine type. In most localities there was an increase in the number of eggs compared to 1959 counts. Egg counts were very high in some stands where defoliation was severe. In other localities where defoliation was light, egg mass counts were sufficiently high to indicate that defoliation will probably be severe in 1961. Very little egg parasitism was apparent and high populations are likely to occur on an additional 60,000 acres in 1961. (See maps, pages 14, 15, 16, 17, and 18)

Elsewhere in the state little defoliation occurred. A light infestation was reported on about 1,000 acres in Marinette County and a small area of noticeable defoliation was found in Eau Claire County.

Note: Larvae were feeding in staminate flowers in Eau Claire County on May 15. On May 18, jack pine candles were one to four inches long and budworm larvae were in the third instar. Staminate flowers were just starting to turn yellow in Polk County and were green in Douglas County. By June 15, larvae were mostly in the third and fourth instars in most northwest counties and in the third to fifth instars in the West Central Area. Mostly fourth and fifth instars were found in the northwest by June 25, and by July 1, some pupae were reported in Washburn and Douglas Counties. In Jackson County pupae were the predominant stage on July 1, although some mating moths were observed.

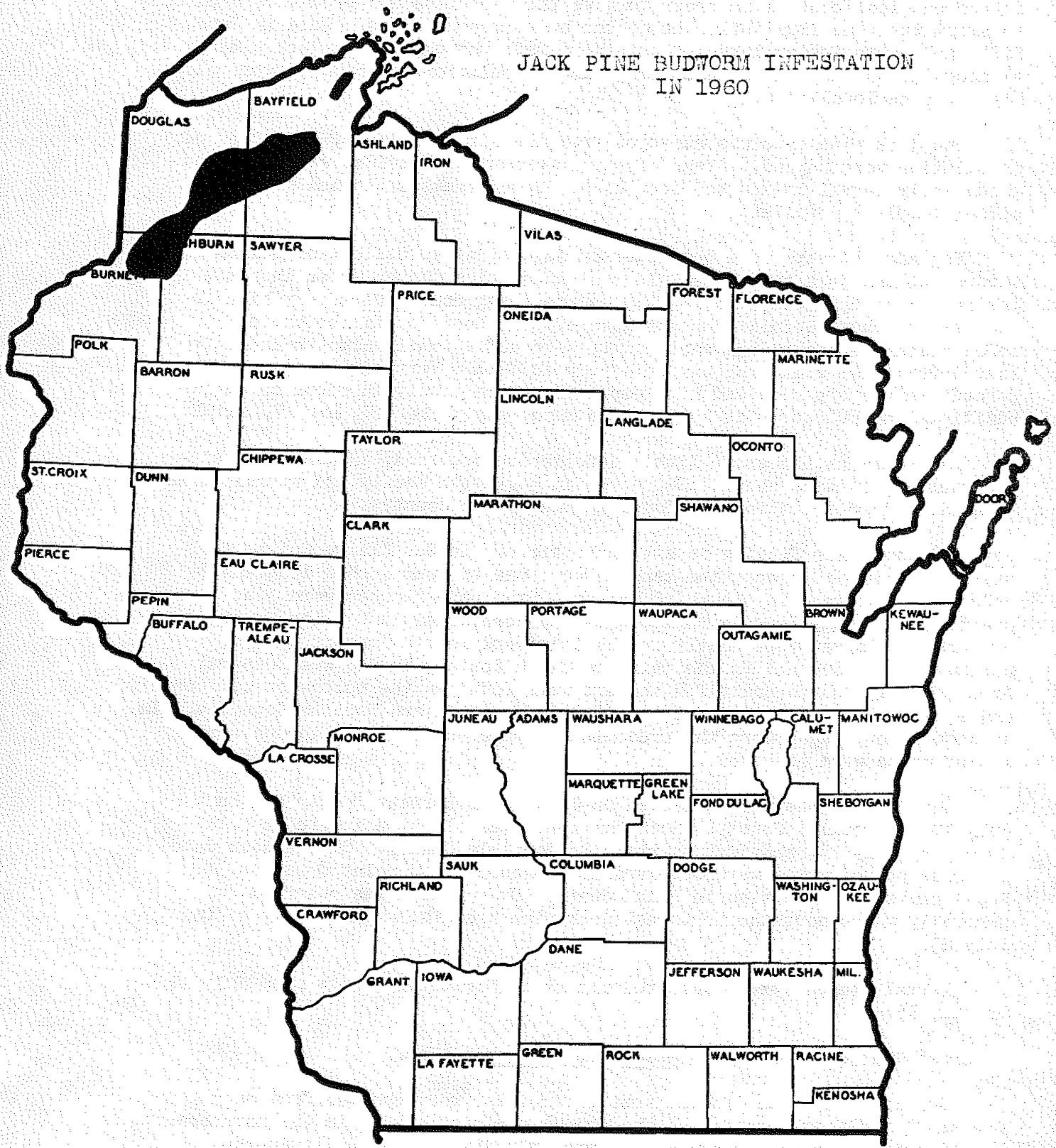
The first moths were observed on July 7, in Burnett County and on July 10, in Douglas County. Moth emergence was almost complete in Polk County by July 15, and just starting in Bayfield County. On the same date numerous paired moths were observed in Washburn and Douglas Counties. Pupal parasitism was high in Polk County. Oviposition was observed generally throughout the northwest jack pine area the week of July 17 to July 23.

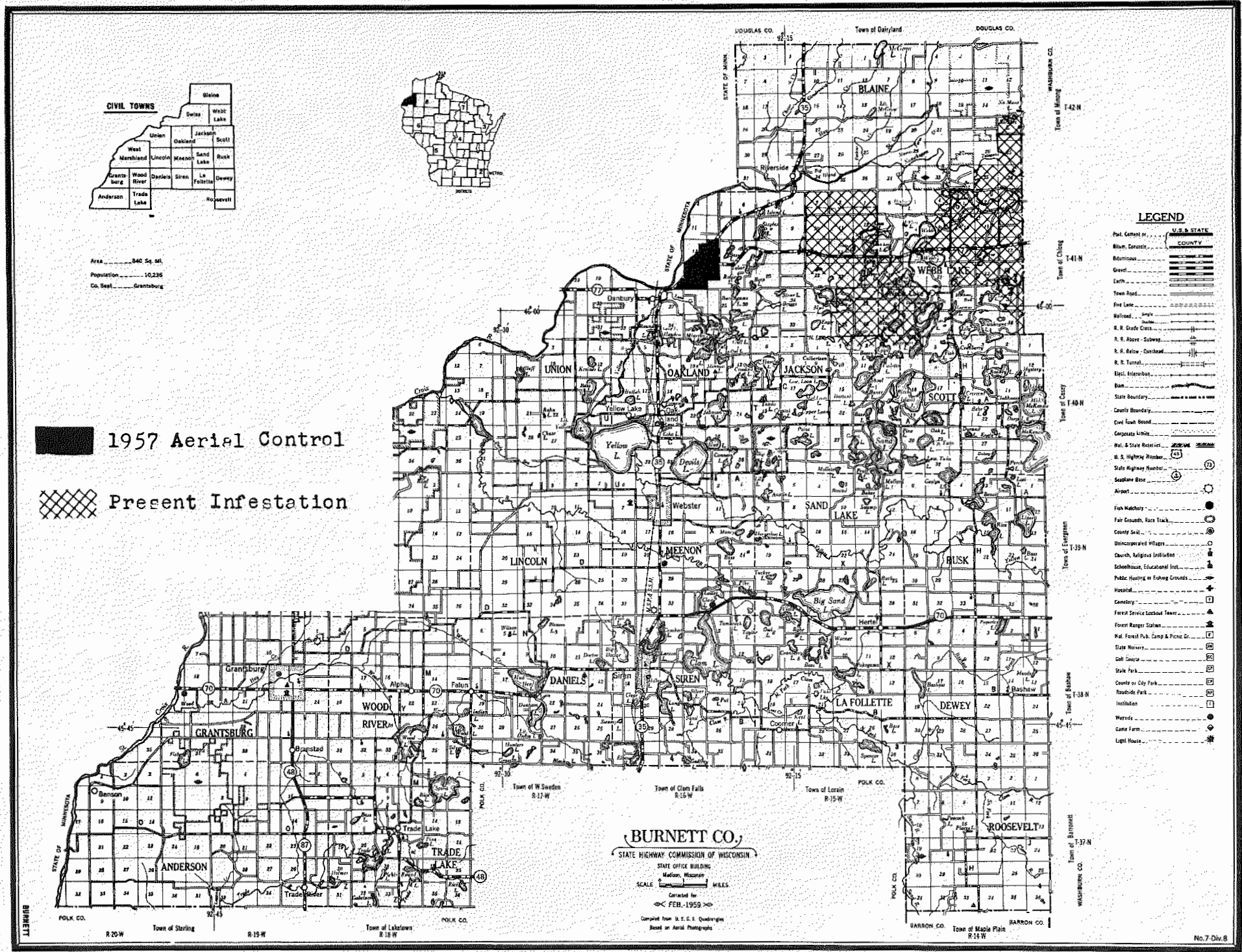
Larval stages were still predominant in Marinette County from July 11 to July 15.

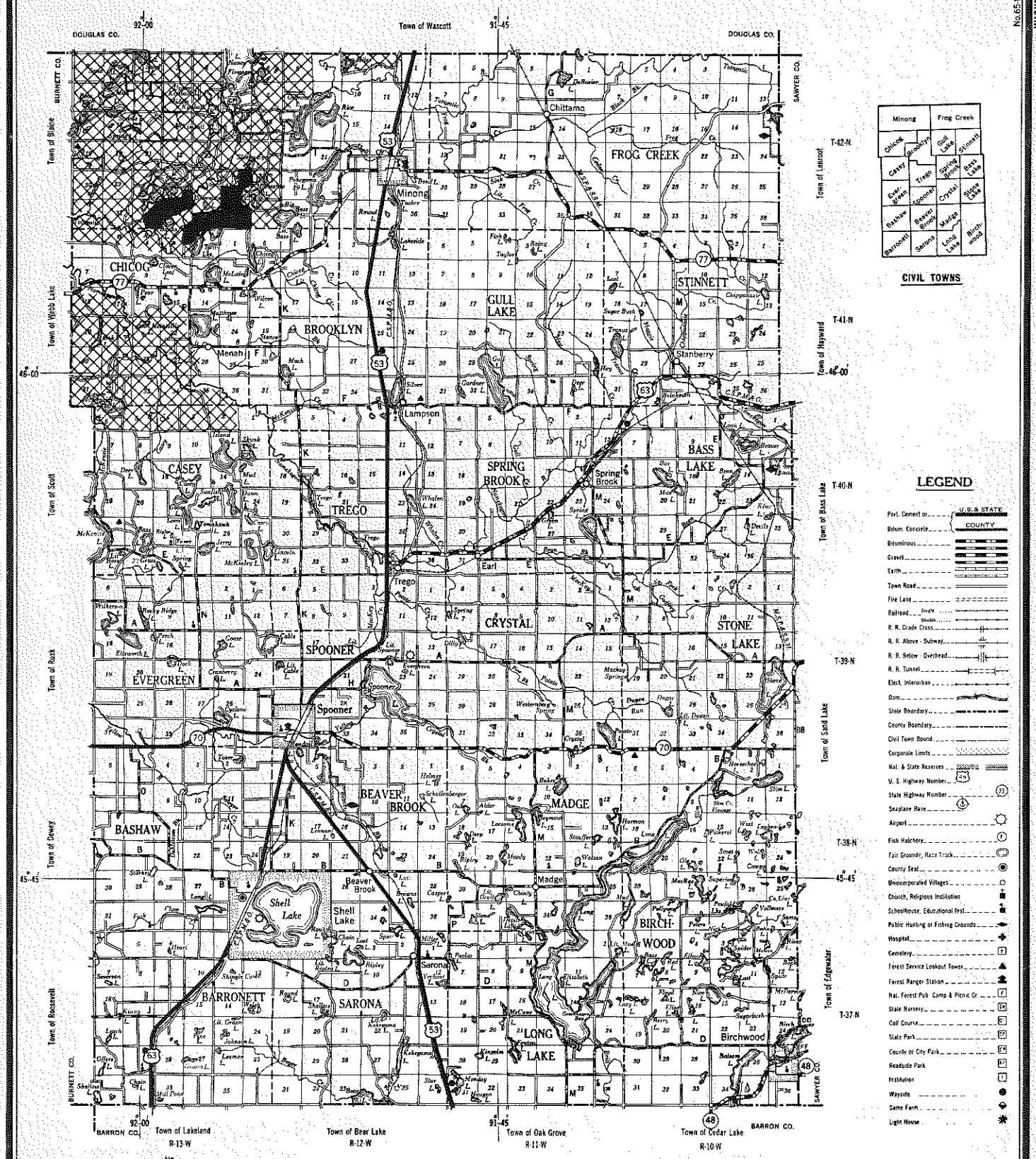
Forest Tent Caterpillar -- Malacosoma disstria (Hbn.)

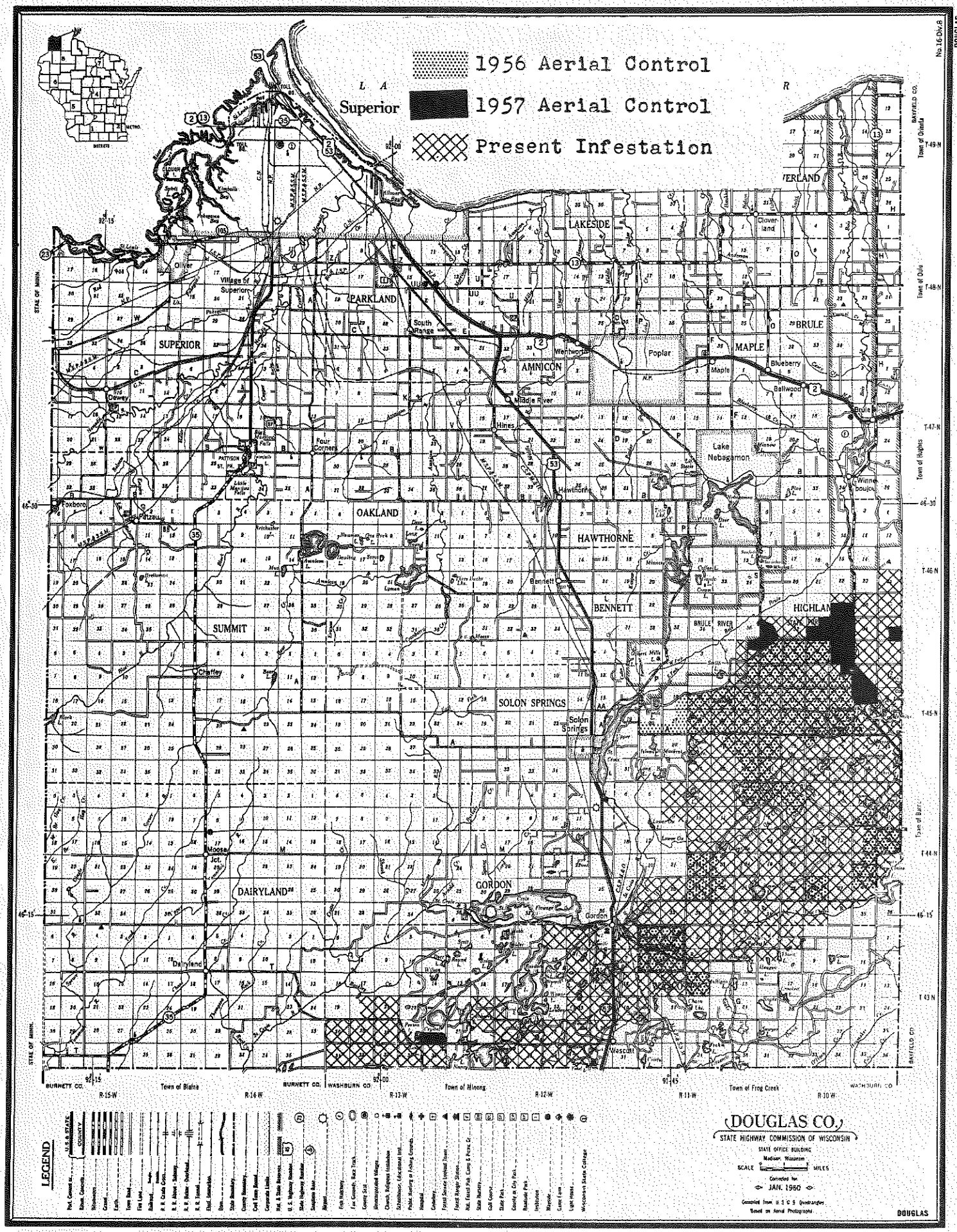
Defoliation by the forest tent caterpillar was reported from only a few small isolated locations. The annual egg mass survey in the northern counties revealed no new egg masses and only six old ones. It appears that larval populations in 1961, will be the lowest in several years.

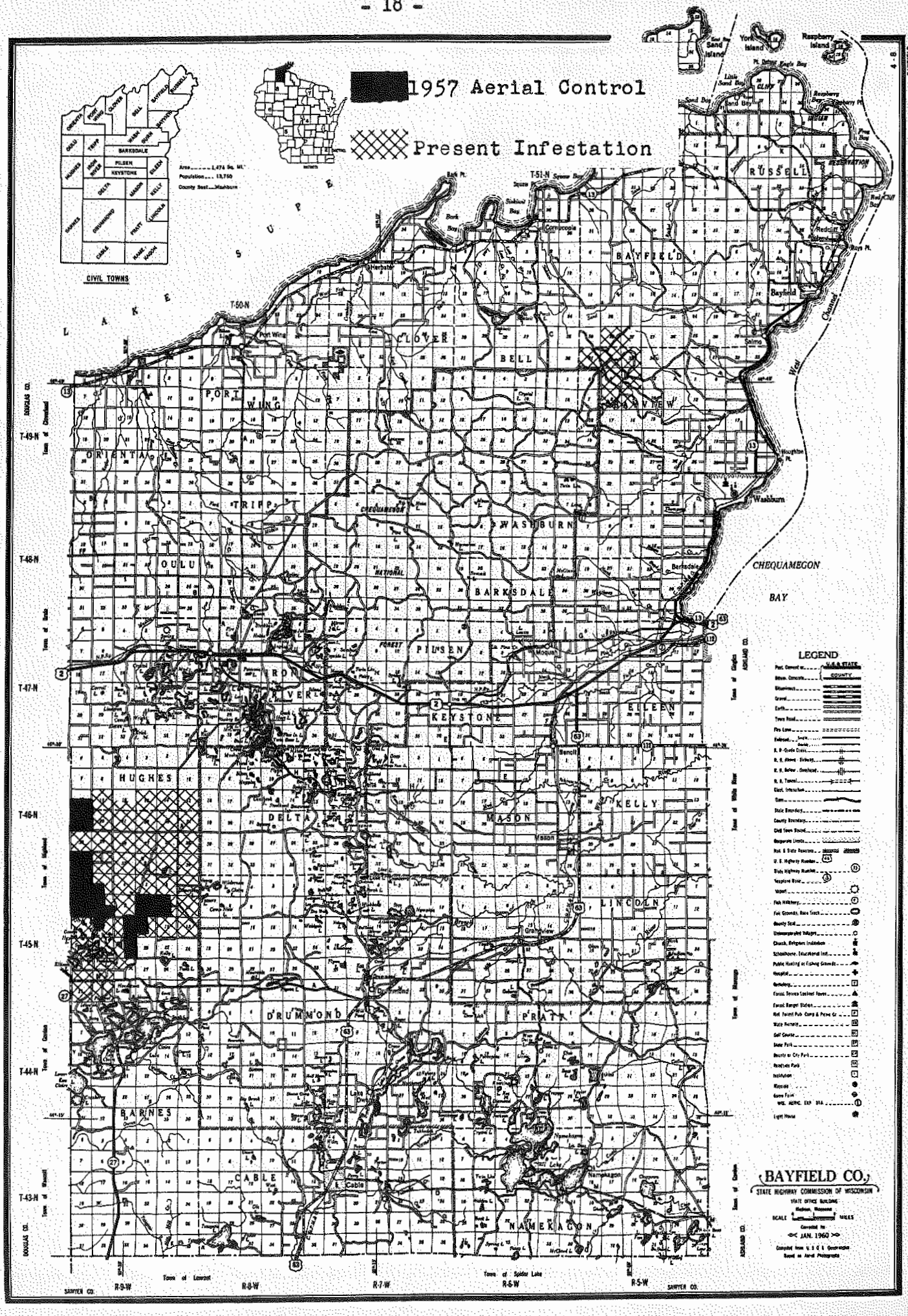
Note: First instar larvae were observed in Langlade County on April 20. Larvae were in the last instars in Langlade, Oneida, Price Counties by June 10.


JACK PINE BUDWORM INFESTATION
IN 1960
DOUGLAS
BAYFIELD
ASHLAND
IRON
VILAS
SAWYER
PRICE
FOREST
FLORENCE
ONEIDA
MARINETTE
POLK
BARRON
RUSK
LINCOLN
LANGLADE
TAYLOR
OCONTO
CHIPPEWA
ST.CROIX
DUNN
MARATHON
SHAWANO
DOOR
CLARK
PIERCE
EAU CLAIRE
PEPIN
WOOD
PORTAGE
WAUPACA
BROWN
KEWAU-
NEE
BUFFALO
TREMPE-
ALEAU
JACKSON
OUTAGAMIE
JUNEAU
ADAMS
WAUSHARA
WINNEBAGO
CALU-
MET
MANITOWOC
MONROE
LA CROSSE
MARQUETTE
GREEN
LAKE
FOND DU LAC
SHEBOYGAN
VERNON
SAUK
COLUMBIA
DODGE
RICHLAND
WASHING-
TON
OZAU-
KEE
CRAWFORD
DANE
GRANT
IOWA
JEFFERSON
WAUKESHA
MIL.
LA FAYETTE
GREEN
ROCK
WALWORTH
RACINE
KENOSHA


CIVIL TOWNS
Glaine
Swiss
Webb Lake
Union
Oakland
Jackson
Scott
West Marshland
Lincoln
Meenon
Sand Lake
Rusk
Grantsburg
Wood River
Daniels
Siren
La Follette
Dewey
Anderson
Trade Lake
Roosevelt
Area 840 Sq. mi.
Population 10,235
Co. Seat Grantsburg
1957 Aerial Control
Present Infestation
BURNETT CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE MILES
Corrected for
FEB.-1959
Compiled from U. S. G. S. Quadrangles
Based on Aerial Photographs
LEGEND
Post, Cement or
Bitum. Concrete
Bituminous
Gravel
Earth
Town Road
Five Lane
Railroad
R. R. Grade Cross
R. R. Above - Subway
R. R. Below - Overhead
R. R. Tunnel
Elect. Interurban
Dam
State Boundary
County Boundary
Civil Town Bound
Corporate Limits
Nat. & State Reserves
U. S. Highway Number
State Highway Number
Seaplane Base
Airport
Fish Hatchery
Fair Grounds, Race Track
County Seat
Unincorporated Villages
Church, Religious Institution
Schoolhouse, Educational Inst.
Public Hunting or Fishing Grounds
Hospital
Cemetery
Forest Service Lookout Tower
Forest Ranger Station
Nat. Forest Pub. Camp & Picnic Gr.
State Nursery
Golf Course
State Park
County or City Park
Roadside Park
Institution
Wayside
Game Farm
Light House
U.S. & STATE
COUNTY
DOUGLAS CO.
Town of Dairyland
WASHBURN CO.
STATE OF MINN.
Town of Maning
T-42-N
BLAINE
Riverside
Town of Chicog
T-41-N
WEBB LAKE
Danbury
UNION
OAKLAND
JACKSON
SCOTT
Yellow Lake
Town of Casey
T-40-N
Webster
SAND LAKE
MEENON
LINCOLN
RUSK
Town of Evergreen
T-39-N
Big Sand L.
Herte
DANIELS
Siren
SIREN
LA FOLLETTE
DEWEY
Bashaw
Town of Bashaw
T-38-N
Grantsburg
Alpha
Falun
WOOD RIVER
GRANTSBURG
Bransted
Benson
Trade Lake
TRADE LAKE
ANDERSON
Trade River
ROOSEVELT
Town of Barronett
T-37-N
STATE OF MINNESOTA
POLK CO.
Town of W. Sweden
R-17-W
Town of Clam Falls
R-16-W
Town of Lorain
R-15-W
Town of Sterling
R-20-W
R-19-W
Town of Laketown
R-18-W
BARRON CO.
Town of Maple Plain
R-14-W
No.7-Div.8
BURNETT


WASHBURN
No.65-Div.8
Town of Wascott
DOUGLAS CO.
BURNETT CO.
SAWYER CO.
Town of Blaine
Town of Webb Lake
Town of Scott
Town of Rusk
Town of Dewey
Town of Roosevelt
Town of Lenroot
Town of Hayward
Town of Bass Lake
Town of Sand Lake
Town of Edgewater
T-42-N
T-41-N
T-40-N
T-39-N
T-38-N
T-37-N
92-00
91-45
46-00
45-45
Chittamo
FROG CREEK
Minong
CHICOG
BROOKLYN
Menahi
GULL LAKE
STINNETT
Stanberry
Lampson
CASEY
SPRING BROOK
BASS LAKE
TREGO
Trego
Earl
CRYSTAL
STONE LAKE
SPOONER
Spooner
EVERGREEN
BEAVER BROOK
MADGE
BASHAW
Shell Lake
Beaver Brook
BIRCH-WOOD
SARONA
BARRONETT
LONG LAKE
Birchwood
BARRON CO.
Town of Lakeland
R-13-W
Town of Bear Lake
R-12-W
Town of Oak Grove
R-11-W
Town of Cedar Lake
R-10-W
Minong
Frog Creek
Chicog
Brooklyn
Gull Lake
Stinnett
Casey
Trego
Spring Brook
Bass Lake
Evergreen
Spooner
Crystal
Stone Lake
Bashaw
Beaver Brook
Madge
Birchwood
Barronett
Sarona
Long Lake
CIVIL TOWNS
LEGEND
Port. Cement or
Bitum. Concrete
Bituminous
Gravel
Earth
Town Road
Fire Lane
Railroad
R. R. Grade Cross
R. R. Above - Subway
R. R. Below - Overhead
R. R. Tunnel
Elect. Interurban
Dam
State Boundary
County Boundary
Civil Town Bound.
Corporate Limits
Nat. & State Reserves
U. S. Highway Number
State Highway Number
Seaplane Base
Airport
Fish Hatchery
Fair Grounds, Race Track
County Seat
Unincorporated Villages
Church, Religious Institution
Schoolhouse, Educational Inst.
Public Hunting or Fishing Grounds
Hospital
Cemetery
Forest Service Lookout Tower
Forest Ranger Station
Nat. Forest Pub. Camp & Picnic Gr.
State Nursery
Golf Course
State Park
County or City Park
Roadside Park
Institution
Wayside
Game Farm
Light House
U.S. & STATE
COUNTY
1957 Aerial Control
Present Infestation
DISTRICTS
METRO
WASHBURN CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE 0 1 2 3 MILES
Corrected for
FEB.-1959
Compiled from U. S. G. S. Quadrangles
Based on Aerial Photographs
WASHBURN


1956 Aerial Control
1957 Aerial Control
Present Infestation
Superior
LAKESIDE
PARKLAND
SUPERIOR
AMNICON
BRULE
MAPLE
OAKLAND
HAWTHORNE
BENNETT
SUMMIT
SOLON SPRINGS
DAIRYLAND
GORDON
Village of Superior
South Range
Poplar
Blueberry
Bellwood
Middle River
Hines
Four Corners
Lake Nebagamon
Hawthorne
Bennett
Solon Springs
Gordon
Dairyland
Moose Jct.
Oliver
Foxboro
Patzau
Chatley
Wascott
Brule
Maple
Wentworth
Cloverland
Winneboujou
BRULE RIVER
STATE OF MINN.
BURNETT CO.
WASHBURN CO.
BAYFIELD CO.
Town of Blaine
Town of Minong
Town of Frog Creek
Town of Oulu
Town of Hughes
Town of Barr
T-49-N
T-48-N
T-47-N
T-46-N
T-45-N
T-44-N
T-43-N
R-15-W
R-14-W
R-13-W
R-12-W
R-11-W
R-10-W
92-15
92-00
91-45
46-30
46-15
LEGEND
DOUGLAS CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE
MILES
Corrected for
JAN. 1960
Compiled from U. S. C. & G. Quadrangles
Based on Aerial Photographs
DOUGLAS


1957 Aerial Control
Present Infestation
CIVIL TOWNS
Area ..... 1,474 Sq. Mi.
Population 13,760
County Seat ....Washburn
LAKE SUPERIOR
CHEQUAMEGON BAY
Sand Island
York Island
Raspberry Island
Bayfield
Washburn
Ashland
Herbster
Port Wing
Cornucopia
Red Cliff
Houghton Pt.
Barksdale
Moquah
Benoit
Grandview
Namekagon
Lake Owen
Lake Chetac
Lake Chippewa
Lake Cable
Lake Namekagon
Lake Hayward
Lake Nelson
Lake Round
Lake Long
Lake Grindstone
Lake Windigo
Lake Whitefish
Lake Minnesuing
Lake Minnesing
Lake Minnesuing
Lake Minnesing
Lake Minnesuing
Lake Minnesing

Large Aspen Tortrix -- Choristoneura conflictana (Walker)

Defoliation of aspen by the tortrix was severe in parts of Rusk, Price, Taylor, Ashland, Chippewa, and Clark Counties. In the first five counties named there appeared to be some increase in the size of the infested areas, although many stands had smaller populations than in 1959. Light defoliation was reported from parts of Jackson and Wood Counties.

Note: Larvae had reached mid-instars by May 23, in Rusk County. Final instars were reached in Rusk and Taylor Counties by June 6.

Pine Tussock Moth -- Dasychira plagiata (Wlkr.)

Larvae were slightly more numerous in some northwest jack pine stands, but noticeable defoliation did not result anywhere.

Note: Eggs were hatching on jack pine in Douglas and Washburn Counties by August 15.

Zimmerman Pine Moth -- Dioryctria zimmermani (Grote)

Moderate to heavy infestations in galls, cankers, and wounds on the main stems of jack pines were found in Burnett, Washburn, Douglas, and Bayfield Counties. Many of the infested parts of the trees were weakened sufficiently to cause breakage when ice and wet snow moved into the area. Infested red pine leaders were reported in Barron, Price, Polk, and Chippewa Counties.

In the Southern Area light infestations on red pine were reported from Racine, Dane, Iowa, Richland, Crawford, and Grant Counties. Most attacks were associated with sapsucker feeding scars, or other damage to the bole. A few apparently undamaged red pine, about three to four feet high, were attacked. A severe infestation on Austrian pine at the Scuppernong Ranger Station (Waukesha County) has resulted in tree mortality.

Light infestations by Zimmerman moth were reported from Adams and St. Croix Counties where larvae were in the last instars in red and Scotch pine the last week in June.

Jack Pine Shoot Borer -- Eucosma sonomana Kearf.

The shoot borer appeared to be somewhat more numerous in northwest jack pine stands than it was in 1959. Infestations averaged about one per cent.

Pine Webworm -- Tetralopha robustella Zell.

Infestations ranging from light to heavy were reported on red, jack, Scotch, and white pine in Grant County, and on red and jack pines in central and western counties in the Southern Area. Damage was most severe in young red pine plantations in northern Grant County.

Light infestations were reported from other areas, and the insect appeared to be more plentiful in the West Central Area than it was in 1959.

Note: Late stage larvae were collected from red pine in Columbia County on September 28.

European Pine Shoot Moth -- Rhyacionia buoliana (Schiff.)

The population is continuing to rise in the infested eastern counties since they were decimated during the severe winter of 1958-59, when between 98 and 99 per cent of the larvae were killed.

A number of red pine were pruned and shaped the summer following the decline, but growth response of the pruned trees has been disappointing so far.

Note: Larvae were entering the buds in the Point Beach area the second week in May. Adult emergence was first noted at Point Beach (Manitowoc County) on June 28, and on Chambers Island (Door County) on July 13. Most moths had emerged in the Point Beach vicinity by July 13.

Walnut Caterpillar -- Datana integerrima Grote & Robinson

Almost all walnut trees throughout the Southern Area had some defoliation by this pest. Many trees were completely defoliated by mid-August, but defoliation generally appeared to be less severe than in 1959. Larvae were nearly mature in Rock County by August 31, but some were still on the trees as late as September 26, in Columbia County.

Larch Casebearer -- Coleophora laricella (Hbn.)

Very light infestations were reported from all areas. Larvae were slightly more plentiful in some isolated stands in west central counties. Heavy predation by birds was reported in all Southern Area infestations.

Note: Larvae were moving about on larch needles in Dane County on April 22. Pupation was occurring on European larch in Dane County on May 20, and in Grant County on May 26.

Birch Skeletonizer -- Bucculatrix canadensisella (Chamb.)

Premature discoloration and leaf fall were general in Clark, Jackson, and Wood Counties during early September.

Red-Humped Oakworm -- Symmerista albifrons (J. E. Smith)

Larvae were numerous in many hardwood and oak stands throughout the Northwest Area. Reports of defoliation were received from Washburn, Sawyer, Ashland, Price, and Taylor Counties. Defoliation ranged from light to moderate. No severe defoliation was reported from any of the areas.

Maple Defoliators -- Leaf Roller -- Sparganothis acerivorana McKay
Leaf Roller -- Acleris chalybeana (Fernald)
Webworm -- Tetralopha asperatella (Clem.)

These insects were associated with the maple blight problem in Florence County. They are found throughout the northern hardwood type in the Northeast Area. Surveys conducted in Florence County and the rest of the area showed extremely light populations of the above insects the past season.

ORTHOPTERA

Walking stick -- Diapheromera femorata (Say)

An aerial survey in Marinette County in late September, 1960, showed that complete defoliation had occurred on approximately 8,000 acres and moderate defoliation on another 700 acres of red and scrub oak. In 1959, about 11,500 acres were defoliated. The infested area lies mostly in the Town of Stephenson between Thunder Mountain and Crivitz, but some defoliated stands were observed a few miles north in the adjoining Town of Silver Cliff. Poor stands of oak were primarily affected. Some of the same ones had been defoliated in 1959.

Egg counts made from duff samples collected in defoliated stands discolsed up to 193 eggs per square foot. Twenty eggs per square foot reportedly will result in complete defoliation. Eggs laid in 1959, could not be distinguished from those laid in 1960, but it is apparent the insects will continue to be a nuisance in parts of Marinette County again in 1961, unless conditions unfavorable for their development occur. Approximately five per cent of the eggs checked were parasitized.

Light defoliation of oak was observed in a small area of the Menominee Indian Reservation. Other reports of infestations came from Columbia County where black and bur oak and wild cherry were defoliated, and from Waushara County near Plainfield where scrub oak was affected.

Note: Young nymphs were first observed in two Marinette County oak stands on July 8. Late nymphal stages and some gravid females were observed in Marinette County on August 11. Mating and oviposition were still occurring in Columbia County on September 28.

Grasshoppers -- Melanoplus femurrubrum (De Geer), M. differentialis (Thomas), and M. bilituratus (Walker)

Epidemic numbers of grasshoppers occurred for the second consecutive year on an 18-acre plantation near Swan Lake (Columbia County). Severe damage and mortality to young red pine seedlings had occurred in 1959.

The area was sprayed with one-quarter of a pound of aldrin per acre at a cost of $2.50 per acre. Subsequent checks of the plantation and surrounding area showed that the treatment had been successful, although migration from adjacent fields had commenced within a few weeks after spraying.

OTHER INSECTS REPORTED

COLEOPTERA:	
Bronze Birch Borer	Agrilus anxius Gory
Cottonwood Leaf Beetle	Chrysomela scripta Fabricius
Leaf Chafer	Dichelonyx albicollis (Burm.)
Elm Leaf Beetle	Galenucella luteola (Muller)
Locust Borer	Megacyllene robiniae (Forster)
----------	Pissodes approximatus (Hbst.)
Smaller European Elm Bark Beetle	Scolytus multistriatus (Marsham)
DIPTERA:	
Balsam Gall Midge	Cecidomyia balsamicola Lintner
Pitch Midge on Jack Pine	
HEMIPTERA:	
White Pine Aphid	Cinara strobi (Fitch)
Elm Cockscomb Gall Aphid	Colopha ulmicola (Fitch)
Eastern Spruce Gall Aphid	Chermes abietis Linnaeus
European Elm Scale	Gossyparia spuria (Modeer)
Oystershell Scale	Lepidosaphes ulmi (Linnaeus)
Spruce Bud Scale	Physokermes piceae (Schrank)
Pine Bark Aphid	Pineus strobi (Hartig)
Wooly Alder Aphid	Prociphilus tessellatus (Fitch)
Cottony Maple Scale	Pulvinaria innumerabilis (Rathvon)
HYMENOPTERA:	
Black Carpenter Ant	Campanotus pennsylvanicus (DeGeer)
Elm Sawfly	Cimbex americana Leach
Dusky Birch Sawfly	Croesus latitarsus Norton
----------	Diprion frutetorum (Fabricius)
Willow Sawfly	Nematus ventralis Say
Balsam-Fir Sawfly	Neodiprion abietis (Harris)
Yellow-Headed Spruce Sawfly	Pikonema alaskensis (Rohwer)
LEPIDOPTERA:	
Green-Striped Mapleworm	Anisota rubicunda (Fabricius)
Ugly Nest Caterpillar	Archips cerasivoranus (Fitch)
Pine Tube Moth	Argyrotaenia pinatubana (Kearfott)
Cherry Scallop Shell Moth	Calocalpe undulata (Linnaeus)
Spruce Budworm	Choristoneura fumiferana (Clem.)
Yellow-Necked Caterpillar	Datana ministra (Drury)
White-Marked Tussock Moth	Hemerocampa leucostigma (J. E. Smith)
Saddled Prominent	Heterocampa guttivitta (Walker)
Cecropia Moth	Hylaphora cecropia (Linnaeus)
Fall Webworm	Hyphantria cunea (Drury)
Eastern Tent Caterpillar	Malacosoma americanum (Fabricius)
Mourning-Cloak Butterfly	Nymphalis antiopa (Linnaeus)
Pitch Blister Moth	Petrova albicapitana (Busck.)
ORTHOPTERA:	
----------	Dendrotettix quercus (Pack.)

MAJOR FOREST DISEASES REPORTED

White Pine Blister Rust -- Cronartium ribicola Fischer

In 1960, state-wide weather conditions were about average for spread of blister rust except in localized areas where microclimatic factors are usually favorable.

Control work was performed on two national forests and two Indian reservations, plus seven state parks and forests. In addition, ribes-infested areas were reworked on forest crop lands in Burnett, Douglas, Lincoln, Marinette, Oconto, and Sawyer Counties. Eradication costs averaged about $3.60 per acre for labor and direct supervision. Approximately 13,500 acres of control area were worked.

Of the nearly 560,000 acres of white pine in need of protection over 50 per cent is on maintenance status requiring little additional work to insure minimum loss from rust. Control efforts are concentrated on public lands having effective management programs.

The map on page 24 shows the general status of the disease based on currently available data. Lack of symbols in some townships is due to incomplete survey information rather than the absence of a rust hazard.

Oak Wilt -- Ceratocystis fagacearum (Bretz) Hunt

Oak wilt infections appeared to continue to spread in the central and southern counties. In the west central counties infections did not seem to be as plentiful as in 1959.

Oak Mortality

One new area of wilting of oaks was reported in Burnett County. The remainder of the northwest oak area did not show any new symptoms for the second year. The cause of the wilting in that part of the state has not been determined.

Maple Blight

Conditions in the maple blight areas of Florence, Ashland, and Iron Counties remained much the same as they were in 1959. Mortality was confined to young trees in the vicinity of maples killed previously in the Florence County blight area. Trees on very wet sites or with previous heavy crown mortality had chlorotic foliage and underdeveloped leaves.

Shoestring Root Rot -- Armillaria mellea (Vahl.) Quel.

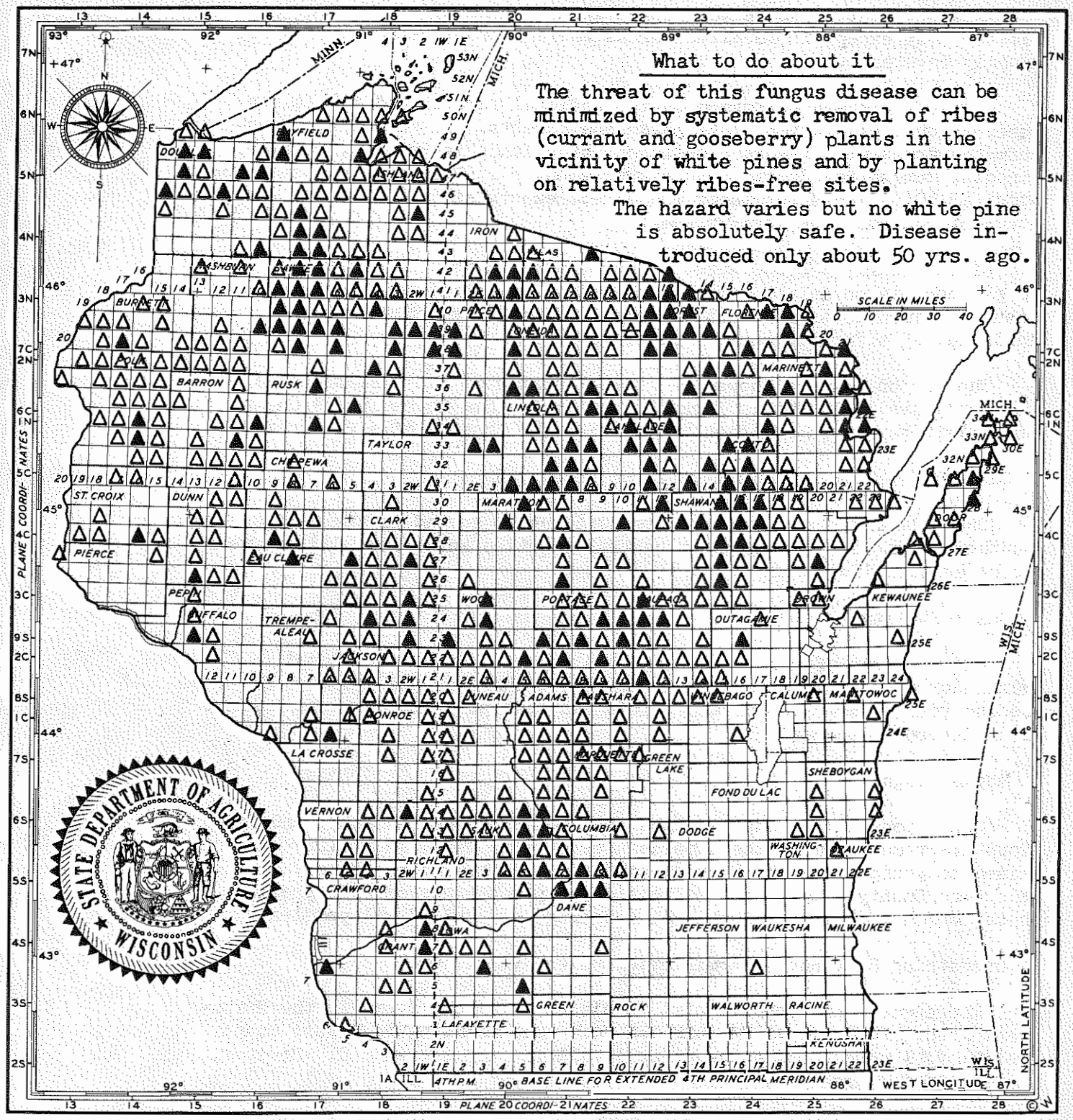
There were many reports of this disease from observers in the Northeast Area. In a 15- to 20-year-old jack pine planting in Oconto County rhizomorphs were found on practically all the trees examined. However, mortality was light.

The active spread of the disease in two previously infected stands in Waupaca County has apparently subsided.

BLISTER RUST ON WHITE PINE

WISCONSIN - 1961

MAP COMPILED FROM OFFICIAL RECORDS BY A. W. DEPTA, U. S. DEPT. AGRIC., FOREST SERVICE, CABLE; RAY WEBER, DO., ANTIGO; H. F. WILLIAMS, WIS. DEPT. AGRIC., PLANT IND. DIV., MADISON.



MAPPED TOWNSHIP LOCATIONS

▲ THOUSANDS OF DEAD AND DYING TREES.

△ FATAL INFECTIONS PRESENT.

RUST NOT REPORTED IN COMMERCIAL STANDS TO DATE - SOME TOWNSHIPS WITH LITTLE WHITE PINE, FEW RIBES OR NOT EXAMINED.

Further information on application

WDA PID JAN 1961 5C

Anthracnose -- Gnomonia sp. on white oak and sycamore.
Gloeosporium aridum Ell. and Ev. on white ash.

Infections in the Southern Area were much more widespread and severe in 1960, than they were the previous year. Most seriously affected were sycamore, white oak, and white ash.

Dutch Elm Disease -- Ceratocystis ulmi (Buisman) Moreau

Several suspect specimens were received from southern counties and transmitted to the Department of Agriculture Dutch Elm Disease Laboratory for diagnosis.

White Pine Blight

Appeared to be prevalent in several southern counties, particularly in Grant, Sauk, and Iowa Counties.

Needle Rust -- Coleosporium solidaginis (Schw.) Thuem.

Two heavily infected red pine plantings were reported, one in Iron County and the other in Marinette County. Heavy and extensive infection of red pine were reported on May 24, in Dane County, on May 28, in Crawford County, and on June 7, in Green and Rock Counties.

Needle Cast -- Lophodermium pinastri (Schrad. ex Fr.)

This disease caused a considerable amount of defoliation in young plantings and natural stands in Marinette and Oconto Counties.

A New Disease Record

ealeau County, were sent
C. Greene identified it
a Sacc. This was described
can records of it on red
rtainly a new fungus for

Wisconsin."

OTHER DISEASES REPORTED

Pine-Oak Gall Rust	*Cronartium cerebrum* Hedgc, and Long
Sweet Fern Blister Rust	*Cronartium comptioniae* (Schw.) Thuem.
Jack Pine Needle Cast	*Hypodermella ampla* (Davis) Dearn.
Hypoxylon Canker	*Hypoxylon pruinatum* (Kl.) Cke.
Verticillium Wilt	*Verticillium* sp.
Wetwood	*Erwinnia nimipressuralis* Carter

MISCELLANEOUS TREE DAMAGE

Mice

Heavy mouse populations in some old-field plantings caused 90 per cent to 100 per cent mortality of seedlings in some plantations in Rusk, Sawyer, Taylor, and Price Counties. Severe damage to young plantations also occurred in the Northeast Area where mice working under deep snow cover stripped the bark from the ground line up to about 15 inches above it. All species of conifers were damaged and mortality reached 75 per cent in some plantings in Lincoln, Oneida, and Langlade Counties.

Reports of damage by mice were also received from some Southern Area counties.

Hail

Severe hail damage occurred in a mile-wide strip of jack and red pine in Oneida County. Several hundred acres of plantations of both species were wiped out and hundreds of acres of natural jack pine had to be salvaged.

5-23-61
nlc